

MARINE REVIEW.

VOL. IX.

CLEVELAND, O., MAY 31, 1894.

No. 22.

Launch of the Kearsarge—Other Ship Yard Work.

It was intended to launch the Interlake company's steamer Kearsarge at the ship yard of the Chicago Ship Building Company to-day (Thursday). The Kearsarge is a notable vessel, differing considerably in design and construction from any other lake freighter. Her principal dimensions are: Length of keel, 328 feet; length over all, 346 feet; beam, moulded 44 feet; depth, moulded 27 feet 6 inches; depth of water bottom 4 feet 6 inches. The ship is built to the rules and under the inspection of the United States Standard Register. It was at first intended to use channel frames, but as the desired size could not be obtained without a serious delay, bulb angle frames were used. Channel frames are, however, used throughout for the floors and beams, making a construction that can be easily worked, and at once remarkably strong and light as well as economical. It is estimated that the gain in strength and lightness is full 15 per cent. over ordinary construction. The Kearsarge is intended for either the iron ore or package freight trade. She has a wood main deck, nine hatches and twelve gangways, six on either side, and a full outfit for handling package freight, and as she was constructed especially with a view to taking advantage of the 20-foot waterway throughout the lakes, she is expected to be an exceptionally large carrier. The first plate of this boat's keel was not laid until Feb. 5, 1894, and it is expected that she will leave the ship yard on July 1, or in less than five months after construction was begun. Engines and boilers were built by the Cleveland Ship Building Company, and work on this part of the ship was fully up with the rapid construction of the hull. The engines are triple expansion with cylinders 23, 38 and 62 inches by 40 inches stroke. Two Scotch boilers are 14 feet diameter and 13 feet long.

The harbor tugs J. R. Sprankle and Marguerite, built by the Globe Iron Works Company for L. P. & J. A. Smith, Cleveland, were also prepared for launching this week. The third of these boats, launched some time ago at the same yard, is ready for service. The J. R. Sprankle is 44.77 tons gross and 23.63 net, and her official number is 77,138. The tonnage of the Marguerite is 27.07 gross and 13.54 net; and her official number is 92,583. These tugs although small are undoubtedly the most complete metal boats ever built on the lakes.

Deep Sea Phenomena.

A practice common among sailors when desirous of securing a small quantity of cool water on Lake Michigan or Lake Superior is to sink an empty jug with lead and line to a distance of 30 or 40 fathoms and draw the water from the bottom of the lake. The jug is corked before it is lowered, but the pressure of water from above is sufficient when a certain depth is reached to force the cork inward and allow the jug to fill. In raising the jug to the surface the water taken in when the cork was removed is not replaced by the warmer water near the surface, and a cool drink is assured. Of course, it is necessary to see that the cork is not too tight and that it is cut off even with the top at the neck of the jug. A sequel to this experiment, which has interested so many people on the lakes, is found in a story told recently by a naval officer:

"We had been on a long cruise," so one of the officers of the United States steamer Albatross is made to say, "and were down near the tropics at Christmas time. Of course, we observed the day as well as was possible under the circumstances, and one of the features was a fine dinner. We had some champagne on board, but the weather was quite hot, and, having no ice, we were at a loss to find a way to cool the wine, which could not be endured as it was. During our cruise we had been making many deep-sea soundings, and it dawned upon us that by sinking the bottles down in the sea about half a mile we could find water cold as ice. This was an inspiration, so we thought, and we immediately sent down a lot on a wire for refrigeration. At the proper time it was drawn up and placed on the table, and we found the bottles delightfully chilled. When the steward opened them, however, there was no 'pop' to the cork, and the wine looked flat and bad when served. What was our astonishment upon tasting it to find that it was pure salt water! I thought at first that it was a bad practical joke, and ordered more wine to be sent down into the cold sea water, but when it was opened we were disgusted to again find only salt water instead of sparkling champagne. You are probably puzzled to find a solution to the matter. Well, it is very simple. At the depth to which we sank the wine, the pressure is enormous—so great, in fact, that the salt water was forced into the bottles through the pores in the corks, and, being more dense than the wine, completely displaced it."

Richard P. Joy.

Readers of the REVIEW and other journals devoted to shipping have become familiar with the writings of Richard P. Joy of Detroit, Mich., on the subject of protection to our merchant marine. Mr. Joy belongs to a family of ship owners and ship builders. His grandfather, James P. Joy, previous to 1812, built ships at Durham, N. H., and a natural interest in marine matters has led him to a study of relations between the government and the shipping interests. He is of the opinion that American shipping engaged in foreign commerce has been and is declining from lack of protection. He holds that the American steamship cannot compete with foreign steamships, having the benefit of mail subsidy, naval reserve subventions and bounties, nor can the American tramp or sailing vessel be operated against the discrimination of British Lloyds insurance in favor of British vessels and the low wages paid to British seamen, with-



out our government extending some encouragement or protection to American vessel owners. He believes in returning to the old system of discriminating duties highly favorable to American ships, and thus saving to the people of the United States the enormous sum of two hundred millions of dollars now paid abroad yearly to foreigners for transportation. We are indebted to the American Shipbuilder of New York for the portrait of Mr. Joy appearing herewith.

In a letter to the REVIEW recently, Mr. Joy says: "The question of free ships is at present attracting some attention, and I hope public opinion will soon demand that justice be done our shipping interests, which at the present time labor under burdens sufficient to crush any industry. Any bill providing for free ships, whether it permits a foreign vessel to be enrolled under the American flag, provided a vessel of like tonnage be built in this country, or whether it permits free ships pure and simple, is a step in the wrong direction. Mr. Pithian is like the captain who seeing that something was wrong with his vessel and that she was sinking, took an auger and went below to bore a hole in the ship's bottom to let the water out. He does not take the trouble to investigate the real cause of the trouble. What he should do is to plug the leaks."

The hydrographic office will soon try a new plan for ascertaining the speed and direction of ocean currents. It will experiment with larger bottles than those heretofore used, shaped like a decanter, the base to be wide and bulky and the neck to be long and slender. The outside is to be stamped with the letters "H. O." and the number. The long neck of the bottle will cause it to stand vertically, and the color and size, it is believed will attract attention. The first trial will take place within the next month or two, when a number of the bottles will be taken to sea and cast adrift.

Around the Lakes.

George A. Butler has been appointed agent of the Northern Steamship Company and Great Northern Railway Company, in Boston, vice A. C. Harvey resigned.

The supplement for June to the Inland Lloyd's Vessel Register contains the names of no new boats, and is confined almost entirely to giving ratings and valuations to boats which had not been inspected in time to secure the filling out of these columns in the main register.

Another Norwegian steamer, the Craggs, arrived in Chicago last week from Bergen with a cargo of 8,000 barrels of herring. She made the trip up the St. Lawrence river and canals and through the Welland without difficulty and will take flour and provisions on the return voyage.

A rule whereby 5 per cent of a vessel's cargo of grain must be damaged before a claim could be made against the underwriters has been abrogated for cargoes of over 40,000 bushels. Full indemnity will now be given for 10 per cent. additional on A1 and A1½ boats, and 20 per cent. for A2 boats.

In reply to an inquiry from the REVIEW, Chief Ramsay of the bureau of navigation, navy department, says that the U. S. S. Michigan is engaged in making a survey of the waters in and about the mouth of the Detroit river, but the department has no other surveys in view at present on the lakes.

As a result of inquiry regarding the great loss of life during the storm of two weeks ago at Chicago, it is more than probable that the life saving station at the entrance to Chicago harbor, which was abandoned for the new station at Jackson park, will be fully equipped for regular service as soon as possible.

Henry W. Howard, one of the most prominent citizens of the state of Michigan, and a gentleman well known to vessel owners in all parts of the lakes, died at his home in Port Huron Friday. He was sixty-one years of age. More extended reference to Mr. Howard's connection with the lake business may be expected in a future issue.

Cleveland's chamber of commerce is showing some interest in the project to straighten and deepen the Cuyahoga river for two or three miles above the south end of the present navigable channel. The opinion that an improvement of this kind could be undertaken by the city and completed without great cost is fast gaining ground.

After considerable labor on the part of President Corrigan and other Cleveland directors of the Lake Carriers' Association, an arrangement has been made with the union ore trimmers at Ashland, to trim ore in all vessels at 2½ cents a ton. Non-union men would certainly have been protected in doing the work but for this agreement.

The death of Mr. E. B. Bartlett is announced from Brooklyn, N. Y., where that gentleman was a wealthy warehouse man. He was president of the Columbian Whaleback Steamship Company, and a large stockholder in the American Steel Barge Company, one of the whaleback fleet bearing his name. He died aged fifty years, and left an estate valued at \$2,000,000.

The squadron sail of the Cleveland yacht club on Decoration day was in every way successful. About 135 members of the club and their friends partook of a dinner that was served when the boats reached Rocky River. The new yacht Commodore Gardner, owned by Ernst W. Radder and G. W. Lutkemeyer, was formally introduced as a valuable addition to the Cleveland fleet and was very much admired.

About the strangest action at law as yet heard of is that proposed by owners of the barges Jack Thompson, Rainbow and others, that went ashore at Chicago in the recent blow. Although Chicago harbor tugs never had a line from these vessels, their owners are trying to collect damages from the tug companies. The worst the tug companies did was to risk their tugs trying to get to the barges, in order to prevent loss of life.

At F. W. Wheeler & Co.'s ship yard, West Bay City, the new Detroit river ferry boat Pleasure was launched Tuesday. She is 132 feet over all in length and her breadth over guards is 51 feet. She will carry passengers on three decks and has accommodations for 3,000 people. The engines are compound, 24 and 34 by 32 inches stroke, and steam is furnished by two boilers 9½x12½ feet, allowed a working pressure of 125 pounds to the square inch.

H. M. Hanna and L. C. Hanna of Cleveland, the former president of the Globe Iron Works Company, and the latter the most active member of the firm of M. A. Hanna & Co., leading producers of iron ore and pig iron, were both connected with the passenger traffic of Lake Superior in its most prosperous days. Speaking of the prospects of commercial success with the Northern Line ships, Mr. L. C. Hanna said that on one trip when he was clerk of the famous Lake Superior steamer Lac la Belle he turned in a passenger list aggregating \$12,000.

At Gibraltar, Mich., below Detroit, Tuesday, a single-decked steam barge was launched from the yard of R. W. Lynn. She is named Wolverine State and is owned by the Wolverine Barge Company of Detroit. The boat is designed to carry about 900,000 feet of lumber on a draft of 12½

or 13 feet. She is 190 feet keel, 204 feet over all and 12 feet hold, and will be fitted with a fore-and-aft compound engine, the cylinders being 20 and 40 inches diameter by 36 inches stroke. The boiler is of the fire-box type, 10½ by 15 feet. Both boiler and engine were supplied by S. F. Hodge & Co. of Detroit.

E. W. Seymour, general manager of the Northern Michigan Transportation Company, has completed arrangements for the lease of the Bradshaw dock at Benton Harbor and Wallace's dock in St. Joseph. The company controls the O'Connor dock in Chicago and will put a line of boats on the Benton Harbor, St. Joseph and Chicago route about June 1. The steamer Puritan, late of the Graham & Morton Transportation Company's fleet, will be the first boat to be put on the new line and a larger and finer steamer will be put on as soon as business demands.

In General.

The first American vessel to pass through the Manchester ship-canal was the Ambrose, with a cargo of oil from Philadelphia.

The French naval estimates for the present fiscal year amount to \$55,400,000, an increase of about \$2,000,000 over the amount provided last year.

The Brown Hoisting and Conveying Company of Cleveland is now building for the Johnson Company of Johnstown, Pa., a traveling crane having a hoisting capacity of five tons and weighing 120,000 pounds.

Richard K. Fox of New York, has contracted with the New York Ship Building Company, for a yacht which is to make 30 knots an hour. It is to have quadruple expansion engines of 1,000 horse power and water tube boilers.

The naval appropriation bill as passed by congress aggregates \$25,335,966, and, although it does not authorize any new ships, about 40 per cent. of the appropriation is for new construction; four million dollars is for armor and armament, and \$5,955,025 is for the construction and equipment of vessels already authorized.

The sum of £12,000, which was accepted by compromise by the owners of the steamer Lake Huron for towing the disabled steamer Spree into Queenstown in December, 1892, has been apportioned by the admiralty court as £9,200 to the owners, £800 to the master, and the remaining £2,000 to the crew of fifty-nine, of whom eleven non-navigating members only receive a half share, and the boats crew who took the connecting line to the ship receive a double share.

We have received from the Tower Publishing Company, Limited, 95 Minories, London, a copy of "Breakdowns at Sea and How to Repair Them" by A. Ritchie Leask. The book describes a large number of breakdowns that have either come under the author's observation, in which case he has given suggestions for repair, or particulars of them have been obtained by him either directly from the parties interested or from narratives furnished by them to various engineering journals.

Quick time made thus early by the new Cunard ships indicate that former transatlantic records are to be lowered this year. The westward run of the Lucania last week is significant. Although not beating her own best record for the run between Queenstown and Sandy Hook, she beat all records for the actual distance covered, having taken a southerly course which carried her over ninety-six more miles. The time was 5 days, 12 hours and 57 minutes. Had the Lucania sailed the course she took in a former record trip, the time would have been 5 days, 8 hours and 27 minutes at the rate of speed of her last week's voyage.

Rushing Shipments from Minnesota Mines.

On Thursday, the 17th inst., the shipments of ore from Two Harbors amounted to 217,296 tons, divided as follows: Chandler, 78,056 tons; Minnesota, 60,488; Canton, 55,381; Franklin, 23,371. A new steam shovel being worked on the Minnesota stock piles takes the place of about 100 men. Its present loading capacity is about 100 cars of 20 gross tons each per day, and it is expected that this average can be increased later in the season.

Proposals for a New Fire Boat.

In another part of this issue, the Cleveland director of fire, Mr. Hyman, asks for bids on the hull of the new fire boat. Although the advertisement speaks of a hull of wood, iron or steel, the department is understood to be favorable to steel, and it is the intention to give all builders on the lakes an equal chance in bidding for the job.

A BASE BALL SCHEDULE of the National League will be mailed free to any address on application to the General Passenger Agent of the Nickel Plate road. In addition to the dates of games, spaces for entering scores, etc., this little book will give you some information about the splendid passenger service of the Nickel Plate road.

"ROPER'S LAND AND MARINE ENGINES," BOUND IN MOROCCO WITH FLAP AND POCKET, WILL BE MAILED TO ANY ADDRESS FOR \$3.50 SENT TO THE MARINE REVIEW, CLEVELAND, O.

More Sales of Ore.—Improved Outlook for Freights.

As far as the iron business is concerned, a brighter outlook now presents itself to the vessel owners, but as indicated by a careful summary of the situation that follows, better freights may be delayed for some time and a great deal depends upon a movement of grain. Sales of ore within the past ten days have been in the aggregate greater than at any time since the general selling movement that followed the first sales of Norrie some time ago. Bessemer ores, aside from the Missabes, can now be said with certainty, to be practically sold up, and the transactions of the past week have, in fact, been mostly of Missabe ores to furnace men who were in the market making up mixtures. The Minnesota company sold considerable Canton, and M. A. Hanna & Co., representing the Chapin, have found purchasers for all ore that can be produced from that mine this season. If present conditions had been anticipated and the Chapin had been started earlier, an increased product would have been assured, but as it is, provision has been made for all the ore the mine can produce. The statement that about 1,250,000 tons of Missabe ore has been sold in all may be surprising even to some of the ore dealers themselves, but this is an estimate made by two sales agents whose interests in the range are sufficient to cause them to keep well posted, although not partial to the ore, on account of greater interests elsewhere. Such sales of non-Bessemer as have been made are entirely of surface ore, either at the mines or on Lake Erie docks, and there is as yet nothing in the outlook to warrant a resumption of operations in any of the non-Bessemer mines. Now, while it is true that the product of the mines producing Bessemer is practically all sold, it is generally admitted that, allowing for an output of 1,500,000 tons from the Missabe, the maximum output of ore from all Lake Superior mines cannot be more than 6,500,000 tons, largely on account of the suspension during the winter that resulted in limited stock piles at the mines when the season opened. An active movement of coal is, of course, expected during the short season that will follow a settlement of the labor troubles, but the question among vessel owners is whether the possible output of ore referred to will be sufficient to cause improved freights without some movement of grain. Most owners are of the opinion that without a liberal movement of grain there can be no marked improvement in freights. For ten days past there has been a constant demand for "wild" boats to take ore at 80 cents from the head of the lakes, 65 cents from Marquette and 50 cents from Escanaba, but shippers have resisted all efforts to advance these rates. Neither do they offer any better freight than 80 cents for the balance of the season from the head of the lakes, or 65 cents for several trips from Marquette. In view of the probability of high coal freights and a possible active movement of grain there is, however, a strong feeling among owners that rates will range a little above present figures during the summer months and that the middle of September will see a decided improvement in all branches of the lake trade.

Preparations are being made for a more general use of hard coal for fuel in the big steel boats if the soft coal famine continues, but the present indications are that the coal strike will be settled before it is necessary to resort to extreme measures, although shipments of coal in cargoes will not be resumed for some time after miners begin returning to work.

For Navigation of Niagara River.

The following is from Major Ruffner, corps of engineers, U. S. A., in charge of river and harbor improvements at Buffalo:

"In the hope that I may contribute to the lessening of accidents arising from vessels striking on the Horseshoe reef at the head of the Niagara river, I am led to make some suggestions to navigators. Vessels going down the river after passing the Dummy light-house at the head keep the first black buoy on their starboard hand, and then come onto the ranges. As they go down, they find the new black buoy on their starboard, also, and as this buoy is important, I have arranged to watch it while we are at work on the shoal, and shall keep this buoy in its proper spot. There is good water between the ranges and this buoy, and close up to this buoy. This is the channel. Vessels drifting to the west are liable to strike the ridge left by the dredge. The Jenness struck this, and probably also the Santa Maria. They are influenced by the cross-current at this point, which takes them westwardly and which must be provided against by both the towing vessel and those towed. It may take the dredge two months to finish clearing the shoal she is on, and during that time there shall always be a ridge where she works, and vessels drifting to the west are liable to hit it. After vessels are abreast the red buoy they do not continue on the ranges, but head for the east, or the west of the inlet pier. We hope to put a dredge on the obstruction struck by the Newaygo before long, but it can not be done yet."

Proposed Tests of the North West's Boilers.

A short time ago it was announced that two engineers from the bureau of steam engineering, navy department, would make some scientific tests on the Northern Line steamship Northwest, giving special attention to the Belleville water tube boilers. Although the management of the Globe Iron Works Company and the owners of the boat seemed en-

tirely satisfied to have the tests made, Miers Coryell objected in very strong terms, upon his return from Europe a few days ago to the navy being permitted to make an investigation of any kind regarding the boilers. He has never been very kindly disposed toward American naval officers, since his connection with the Belleville boiler in this country. He charges the heads of the navy with having retarded the progress of tubulous boilers in the United States, and he says they would not now show an interest in the Belleville generator, but for the action of the British admiralty in boldly adopting it for large vessels of war against a strong feeling throughout Great Britain favorable to home supremacy in all matters pertaining to shipping. Mr. Coryell says that the owners of patents on the Ward and Cowles boilers were put to enormous expense by our navy in securing even the slight recognition that they have obtained for their generators. Of course, he does not, however, own the big passenger ship, and either builders or owners of the ship are at liberty, aside from considering his desire in the matter, to permit of the tests being made.

Mr. Coryell sails for London again this week, to be gone for an indefinite period, and although he made no statement of his plans before leaving, it is understood that he will be associated with the British admiralty as consulting engineer in the work of fitting Belleville boilers to new war vessels.

Voyages of the Campania and Lucania.

Following is a statement of the time of voyages made by the Cunard Line steamers Campania and Lucania:

CAMPANIA.

No. of voyage.	Distance.	Time.	Average Speed.	Mean speed for round voyage.
		<i>d. h. m.</i>		
1.....	2,858	6 8 51	18.70	20.00
	2,927	5 17 32	21.29	
2.....	2,812	5 21 15	19.92	20.275
	2,895	5 20 18	20.63	
3.....	2,880	5 16 22	21.11	21.01
	2,913	5 19 18	20.91	
4.....	2,796	5 15 24	20.65	20.495
	2,825	5 18 57	20.34	
5.....	2,781	6 2 57	18.93	19.885
	2,816	5 15 4	20.84	
6.....	2,802	5 18 22	20.25	20.16
	2,820	5 20 30	20.07	
7.....	2,783	5 13 37	20.83	21.00
	2,799	5 12 15	21.17	
8.....	2,790	5 20 45	19.83	20.215
	2,820	5 16 54	20.60	
9.....	2,863	6 13 2	18.24	19.70
	2,871	5 15 44	21.16	
Mean speed for nine round voyages.....				20.304

LUCANIA.

1.....	2,751	5 16 19	20.18	20.235
	2,785	5 17 16	20.29	
2.....	2,782	5 14 1	20.76	20.86
	2,802	5 13 41	20.96	
3.....	2,780	5 13 2	20.90	19.42
	2,853	6 15 0	17.94	
4.....	2,785	5 15 52	20.49	20.71
	2,817	5 14 35	20.93	
5.....	2,876	6 16 17	17.94	19.855
	2,900	5 13 14	21.77	
6.....	2,907	5 18 47	20.94	21.285
	2,892	5 13 40	21.63	
Mean speed for six round voyages.....				20.394

The best time has then been made by the Campania, 5 days 12 hours and 15 minutes, although the Lucania has made the greatest speed, not only for the mean of the round voyages, but also for a single and round voyage, as well as for the day's run in each direction, her biggest runs being 546 miles when running to the westward, and 516 to the eastward.—Journal of American Society of Naval Engineers.

Notices to Mariners.

About June 8, the fourth-order red fixed light at Porte des Morts (Pilot island) light station, in Lake Michigan, at the entrance to Green bay, will be changed to a fixed white light varied by a white flash every 15 seconds.

The nun buoy marking Eleven-Foot shoal off Point Peninsula, northern end of Green bay, has been replaced. The first-class can buoy marking the reef off Racine, Wis., is reported as being out of position on account of a recent gale. The buoy will be reset at an early date and a notice to that effect will be published.

SEND a postal card to B. F. Horner, G. P. A., Nickel Plate, Cleveland, O., for "Summer Outing" for information where to go to picnics.

Wind Force and Lake Water Levels.

Although vessel masters on the lakes have for all time past been of the opinion that marked changes in the water level at the St. Mary's Falls canal and in other connecting channels of the lakes are due to wind direction and force, the weather bureau now tells us that such is not the case. Attention was directed in the REVIEW a short time ago to a circular from the weather bureau giving the results of a study of this question made by one of the officers of the service, and Mr. B. L. Pennington of Cleveland wrote Chief Harrington, partly with a view to learning whether the officers of the bureau were really as emphatic in their claims regarding the theory as the circular would indicate. The answer from Acting Chief Dunwoody to Mr. Pennington's letter states very positively that the rise and fall of water in the canal is independent of wind force and direction. The circular says:

"A summary of the results obtained shows that marked rises in the water level attended the passage of a common type of low areas which move eastward from Manitoba and Minnesota. Forecasts of increases in the stage of water in the canal must, therefore, depend upon the movements of low areas which appear west of Lake Superior. As low areas of this class advance from the Red River of the North Valley over eastern Lake Superior in about twenty-four hours, the presence of a well defined low area over Manitoba or Minnesota in the morning would generally justify a forecast of a rise in water in the canal of at least .25 foot by the morning of the following day. Forecasts of falls in the water level can be made when the stage of the water is above the average and an area of high barometer is advancing toward the upper lakes."

The circular also says that "the wind direction and force are not, apparently, active agents in producing the changes in the stage of water, but are incidental to the passage of low and high areas." This latter statement is referred to particularly by Mr. Pennington, as will be seen by his letter which follows:

Major M. W. Harrington, Chief of Weather Bureau, Washington, D. C.,
Dear Sir:—I duly received your circular of April 30, in regard to the movements of high and low areas of pressure influencing the stage of water. You say the wind is not an active agent in producing the changes in the stage of water but is incidental.

There is a general opinion among vessel men, I believe, that the winds are a great factor, perhaps the most important factor, in determining the stage of water at the "Soo." The movements of areas of high and low pressure must largely determine the winds, therefore the movements would result in determining or influencing the stage of water by means of winds which they produce.

It is well known that a strong westerly or northwesterly wind down Lake Superior will cause a rise of water at the "Soo," and that a strong southeasterly or easterly wind will lower the water. I apprehend such movements as you describe as influencing the stage of water at Sault Ste. Marie canal, would operate as follows: An advancing low barometer area from west or northwest, over Lake Superior, would cause an easterly wind until the easterly rim of the area had passed the "Soo," lowering the water at that point. Meanwhile when the westerly rim of the area struck the lake, the wind would have veered to westerly and would continue to blow from this direction until the whole area had passed the "Soo," raising the water at that point proportionately to the force and duration of the wind.

This raise of water would be more obvious from the fact of the fall in the stage of water that preceded it.

I am not an expert in these matters and may be all wrong in attributing so much influence to the winds, directly. If not too much trouble I should be pleased to get further information as to how the stage of water is influenced by barometric pressure wholly independent of the winds that follow.

B. L. PENNINGTON.

Cleveland, May 21, 1894.

The reply from Acting Chief H. H. Dunwoody to the foregoing letter from Mr. Pennington, follows:

Mr. B. L. Pennington, Dear Sir:—In reply to inquiries contained in your favor of the 21st inst, I would state that a study of records and observations shows that the rise and fall of water in the Saint Mary's Falls canal is intimately associated with the movements of high and low pressure areas and is independent of wind force and direction. In the cases of marked rise in the water, the winds have been from the southeast as often as from the northwest at the time the rise occurred, and the directions were due to the cyclonic circulation of air about areas of low pressure advancing over Lake Superior. If the rises were due to northwest winds the winds would have to blow with considerable force from that direction for some time in order to force the water towards the eastern end of the lake. As a matter of fact the rises occur about the time, or even before, the shift of wind to the northwest. The falls in the water usually attend the passage of an area of high pressure over the lake, and the winds in such cases would be light and variable, shifting to easterly. The changes in water level in the canal seem to be due to differences in atmospheric pressure over Lake Superior. When the pressure is low over the eastern end of the lake and high over the western end, the water is ap-

parently forced by this difference in pressure from the lake towards its eastern outlet, and when the pressure is high over the eastern and lower over the western end of the lake, the water is apparently forced from the eastern end by the greater weight of the atmosphere over that portion of the lake.

Washington, D. C., May 25, 1894.

H. H. DUNWOODY,
Acting Chief, Weather Bureau.

Taxation of Vessel Property.

Editor MARINE REVIEW.—Great Britain, Germany and France impose taxes on the incomes derived from steamships and vessels as on incomes derived from other productive property. The rate is understood to vary with budget requirements from year to year, but the tax is not a large factor in the expense account of those operating vessels. The North German Lloyd Company, for example, on its fleet of eighty iron and steel steamers of 225,097 tons—larger by 2,000 tons than the entire registered iron and steel steam tonnage of the United States—paid an income tax of 94,000 marks (\$22,372) for 1893. For 1893 the city of Bath, Maine, collected \$24,026 taxes on 224 vessels of 119,999 tons, mostly wooden sailing vessels, besides taxes on capital stock of corporations owning ferry boats, tug boats and steamboats. On January 1, 1894, Austria exempted all sea-going vessels from income tax for five years, and all new sea-going vessels built in Austrian yards are exempted for five years from date of register from this tax.

Vessels are not subject to federal taxation in the United States, except in the form of a few small fees on entry and clearance for specific services and tonnage tax. As imposed under the act of June 19, 1886, these taxes do not put vessels of the United States at a disadvantage, compared with vessels of other nations; indeed, for the fiscal year 1893 American vessels paid \$70,019 tonnage taxes and foreign vessels \$464,920, of which British vessels alone paid \$338,674. For purposes of comparison it may be noted that the total British subvention to steamships enrolled as cruisers by the admiralty in this year's naval estimates is £21,972, (\$106,839) and that the British post office estimates for this year allow a loss of £62,300 (\$302,934) on the cost of mail transportation to the United States over receipts from such postage, which may be taken as a rough measure of subsidy under the form of mail contract.

The only taxes, accordingly, on vessel property which may be deemed to place vessel owning in the United States at a disadvantage compared with vessel owning in other countries are imposed by state tax laws. These have been modified by decisions of the supreme court of the United States (see particularly Philadelphia Steamship Company vs. Pennsylvania 122 U. S. Reports, 326, in which it is held: "The corporate franchises, the property, the business, the income of corporations created by a state may undoubtedly be taxed by the state; but in imposing such taxes care should be taken not to interfere with or hamper, directly or by indirection, interstate or foreign commerce, or any other matter exclusively within the jurisdiction of the Federal government.")

Since 1881 New York state has exempted "from all taxation for state or local purposes" all vessels registered in the state, engaged in foreign commerce, and this exemption, drawn in the broadest terms is to continue to the year 1922.

Under the decision of the supreme court of the United States noted above, Pennsylvania levies no taxes on vessels in foreign commerce. Delaware imposes no taxes on vessels. Alabama exempts from tax vessels engaged in the foreign trade. In the four states named vessels registered for foreign trade, in so far as taxation is concerned, are more advantageously placed than those subject to income tax in Great Britain, Germany and France. Massachusetts and Connecticut tax vessels in foreign trade on the valuation of net earnings, not deducting insurance for the preceding year, thus placing them substantially on an equality with vessels owned in Great Britain, France and Germany. New Hampshire taxes vessels as "stock in trade."

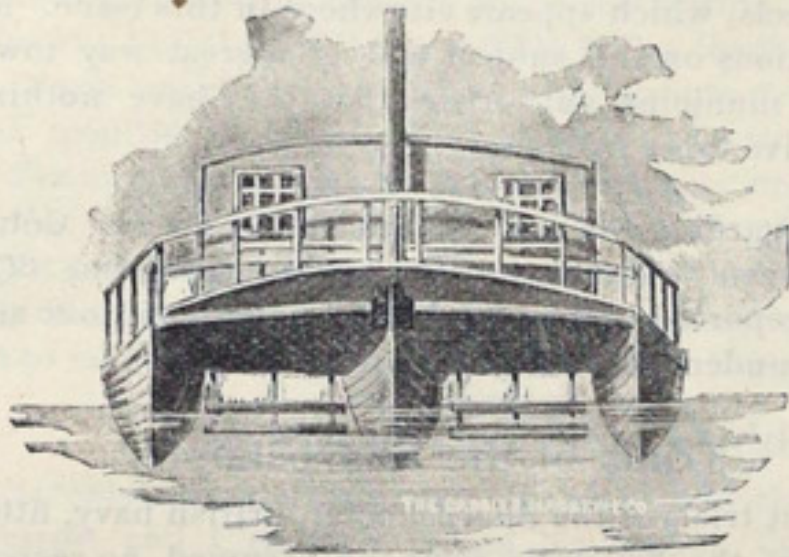
In the remaining twenty-one seaboard and lake states all vessels are taxed as personal property. While nominally assessments are at their full valuation, the valuation varies not only in one state as compared with other states, but also at different ports in the same state. The twenty-one states where this system obtains are Maine, Rhode Island, New Jersey, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Mississippi, Louisiana, Texas, California, Oregon, Washington, Ohio, Indiana, Illinois, Wisconsin, Michigan, Minnesota. In North Carolina, South Carolina and Georgia, more or less elaborate systems of license charges and occupation taxes impose further burdens on shipping.

EUGENE R. CHAMBERLAIN,
Treasury Department, Bureau of Navigation, Commissioner.
Washington, D. C., May 26, 1893.

In the course of the debate on the iron ore paragraph of the tariff bill in the senate, a letter was read from L. S. Bent, chairman of the Jura-gua Iron Company, Limited, of Philadelphia, in which he makes the statement that for the year ending Dec. 31, 1893, the cost of ore from the Cuban properties of this company, free on board ship at Santiago de Cuba, was \$1.14 per gross ton.

Symington's Connection With the Marine Engine.

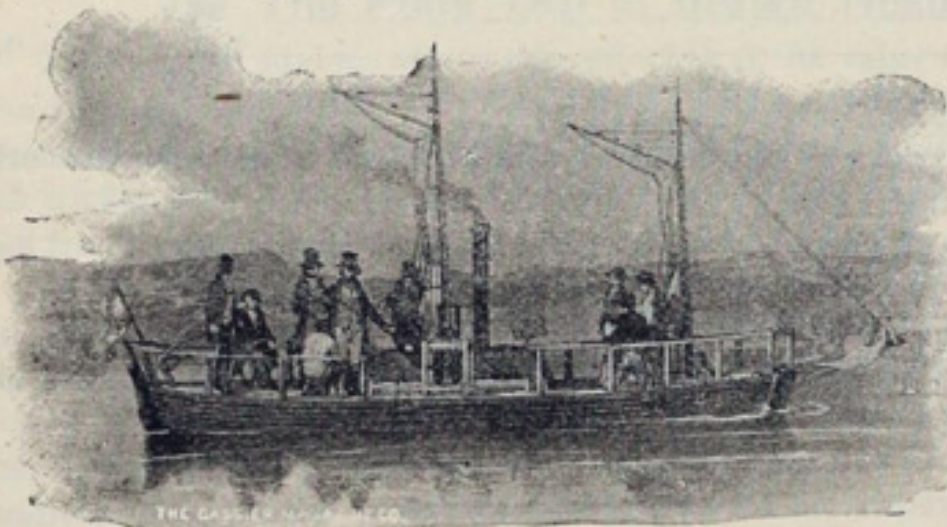
As engineering journals of London and some of the leading publications in this country have of late been collecting and publishing scraps of information regarding William Symington's early experiments in propelling vessels by steam, readers of the REVIEW will probably be interested in this abstract of an article on the "Life and Works of Symington," by William Fletcher in the May number of Cassiers' Magazine. Like many of our engineering ancestors, the subject of Mr. Fletcher's article had no money of his own to work upon, and he was unable to find a pecuniary



MILLER'S TRIPLE BOAT, 1787.

helper, owing to which the latter part of his life was spent in privation as one of the waifs amid the vast wealth of London. Were it not for the inventor's misfortune in this regard, it is claimed, steam navigation would have been an accomplished fact many years before it was actually introduced with practical success.

William Symington was born at Leadhills in Scotland, 1764. He was given a practical training by his father, who was a mechanic and millwright, and at the age of twenty-one he conceived the idea of applying the steam engine to the propulsion of carriages on ordinary roads. For this purpose he was granted a patent for a steam engine on principles entirely new, although opposed by Watt, who claimed that his patent specified the application of steam engines to wheel carriages. Symington allowed his road locomotive to slumber, however, and as early as 1788 turned his attention to the propulsion of vessels by steam. For a few years previous to this time, Patrick Miller, Esq. of Dalswinton, Edinburg, who had made a large fortune as a banker, devoted his attention to purposes that might be of general advantage to his countrymen. He had carried to great length and at very great expense experiments for moving double and triple vessels with wheels worked by capstans, which were in turn operated by men with levers. He was satisfied, however, that unless he could apply a more powerful agent than the men he employed, his invention would be of little use. Mr. Miller had never studied the steam engine and was adverse to its use on the boat, but was induced to apply to Symington by Mr. James Taylor, who was a tutor in the Miller household, and



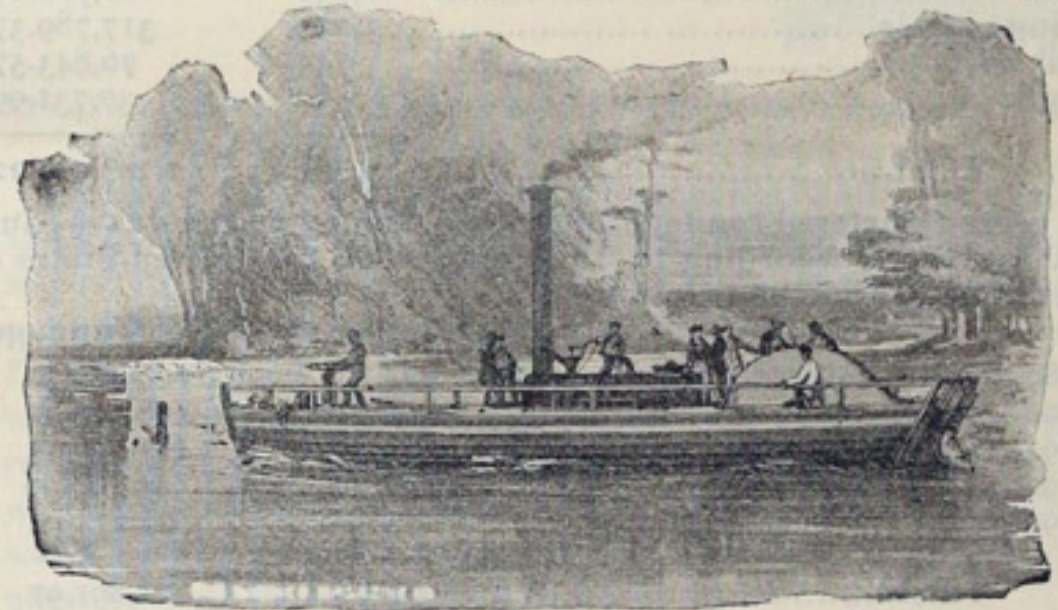
SYMINGTON'S FIRST STEAMBOAT, 1788.

who had seen Symington's engine. Accordingly in the fall of 1788 an engine erected by Symington was placed on the deck of a double pleasure boat. The cylinders were only 4 inches in diameter, yet the vessel moved at the rate of five miles an hour. The hull of this boat was constructed of tinned iron plates, and it was therefore the first iron steamboat. Patrick Miller, the wealthy banker, Symington, the inventor of the engine, and Robert Burns, the poet, and Henry Brougham, afterward Lord Chancellor of England, were among interested witnesses of the trial. The original drawing of the steamer is now in the gallery of the Museum of Naval Architecture at South Kensington, and the engine is carefully preserved at the Patent Museum at Kensington. The success of the trial was referred to at great length in the papers of Great Britain, from which Mr. Fletcher makes extracts in the magazine article, but before covering the invention with a patent, it was decided to repeat the experiment on a larger scale on the Forth and Clyde canal, and to construct the engine at Carron.

Accordingly, in the spring of 1789, Mr. Taylor and Mr. Symington went to Carron, and the latter constructed a double engine, each cylinder being eighteen inches diameter. In the fall of the same year a vessel with the machinery was launched into the canal, and after applying stronger paddles the experiments with the new and more powerful vessel were

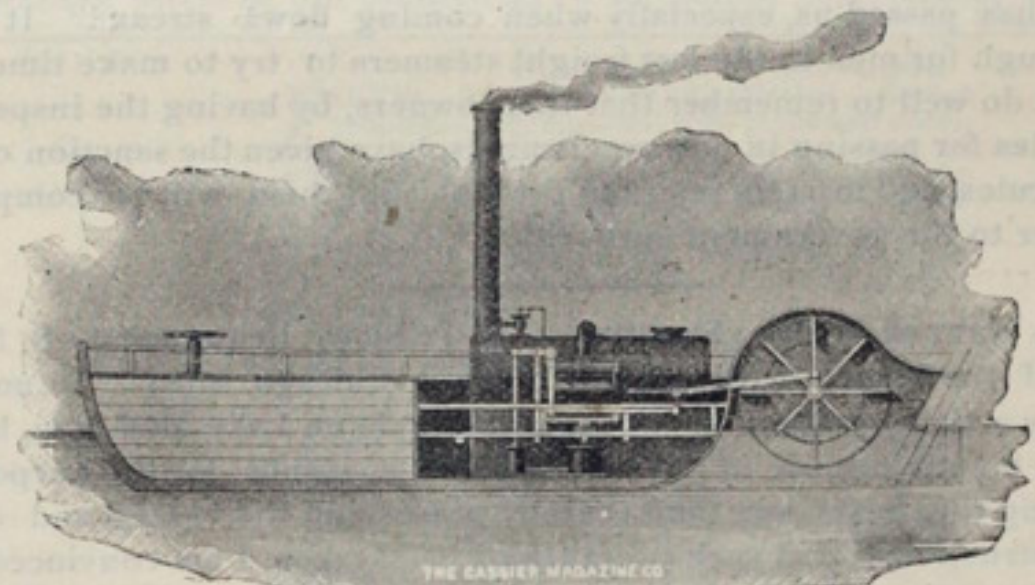
equally successful, a speed of about seven miles an hour having been attained. But in the meantime Mr. Miller, who had provided funds for the experiments had turned his attention into other directions. Agricultural pursuits took such hold of him that no other object could withdraw him from them.

"We lose sight of Symington for the next thirteen years," says Mr. Fletcher, during which time he was by no means idle; but none of his objects could be carried out on account of his lack of funds. As soon as monetary aid was forthcoming, he once more appeared on the scene. In 1801 a patent was granted to him for a new mode of constructing steam engines, and applying their power to the purposes of producing rotary motion, without the interposition of a lever or beam. In this invention there was a horizontal cylinder with steam acting on both sides of the piston, working a connecting rod and a crank. Lord Dundas of Kerse, who was an extensive proprietor of property in the Forth and Clyde canal, employed Symington to make a series of experiments on steamboats, with the view of supplanting the horses employed to draw the vessels on the canal. The result of these experiments was the production of the first practical steamboat, named the Charlotte Dundas. Symington employed his horizontal steam engine to drive the paddle wheels, and by



THE CHARLOTTE DUNDAS, 1803.

keying the crank arm direct to the paddle axle he combined, for the first time, those improvements which constitute the present system of steam navigation. Proofs having been given of the efficiency of the vessel to supercede horses for towing, proposals were made to the proprietors of the Forth and Clyde canal to adopt it. It was feared, however, that the waves produced by the steamer would injure the banks of the canal, and the proposal was therefore rejected. Lord Dundas, however, entertained a more favorable opinion of the subject, and called upon the Duke of Bridgewater for the purpose of recommending the adoption of Symington's steamboat. His grace at first appeared to doubt the utility of the invention, but after having seen a model of the vessel and received explanations from Symington, he gave him an order to build eight boats, similar to the Charlotte Dundas, to ply on his canal. Symington returned to Scotland elated with the prospect of being able to introduce steam navigation in a short time, and to realize to himself the advantages which his ingenuity and unwearied perseverance gave him reason to anticipate; but he was doomed to disappointment, for on the same day that he was informed by Lord Dundas of the final determination of the committee not to allow steamboats to be employed on the canal, he received intelligence of the death of the Duke of Bridgewater. Unable longer to struggle against



MACHINERY OF THE CHARLOTTE DUNDAS.

these misfortunes, his resources being exhausted, he was obliged, with great reluctance, to lay up his boat in a creek of the canal near Brainsford drawbridge, where it remained for a number of years exposed to public view. "Symington's later years were completely wasted in vain attempts to induce capitalists to befriend him, and canal companies to make a trial of his boats. He died in March, 1831, and was buried in the churchyard of St. Botolph, Aldgate. In the summer of 1890 a Symington memorial was unveiled at Leadhills, the birthplace of the ingenious Scotchman. Sixty years were thus allowed to elapse before a monument was erected in memory of a man whose invention has had so marked an influence upon maritime progress."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O
Chicago office, (branch), No. 726 Phoenix building.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each.
Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,761 vessels, of 1,261,067.22 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was, on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	828,702.29
Sailing vessels.....	1,205	317,789.37
Canal boats.....	743	76,843.57
Barges.....	82	37,731.99
Total.....	3,761	1,261,067.22

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
1892.....	169	45,168.98
1893.....	175	99,271.24
Total.....	991	471,891.97

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893.	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of navigation..	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

ALTHOUGH it was expected that the rules for vessels passing in narrow channels, as recommended by the Lake Carriers' Association and adopted in the form of a resolution by the United States board of supervising inspectors, would be adhered to by vessels enrolled within the association, it would seem that the "flyers" are paying less attention to this matter than they did last season. Owners of tows are constantly in receipt of complaints from the captains of their barges about big steamers passing them without any check in speed. A tow barge captain writing to his owner in Cleveland for a new tow line says: "It would make your hair stand on ends to see how we fetch up on a line after one of these big fellows has passed us, especially when coming down stream." It is all well enough for men in the fast freight steamers to try to make time, but they will do well to remember that their owners, by having the inspectors enact rules for passing in narrow channels, have given the sanction of law to such rules, and masters reported for violating them will be compelled to answer to the government authorities.

IN A LETTER to the REVIEW, Geo. P. Blow, lieutenant U. S. N., in charge of the branch hydrographic office at Chicago, says: "In none of the many articles written about the recent gale on Lake Michigan, have I seen any mention made of the use of oil or soapsuds for the purpose of smoothing the heavy seas, and thereby preserving the vessels and crews from destruction. Had such precautions been taken, I am convinced that many lives and much valuable property would have been saved. The use of oil for this purpose has become general at sea, but it is not so well known that soapsuds possess the same property." The pilot chart of the lakes, just issued by the hydrographic office, contains rules for the use of oil, and from the Chicago or Washington office an extended article on the use of soapsuds can be obtained. Any captain can make the experiment for himself at little expense. No harm can be done by giving it a trial, and many lives may be saved by its use.

IN 1893 the revenue of the Suez canal amounted to 76,579,992 francs and the expenses, including 5 per cent. interest, amounted to 36,963,455 francs, leaving a profit of about 40,000,000 francs. From this profit a dividend of 72 francs per share is available, which added to the 5 per cent

interest, makes 97 francs per share. If this canal, doing a business considerably smaller than that of the St. Mary's Falls canal between Lakes Superior and Michigan, is able to pay 5 per cent. interest on bonded indebtedness and return a large revenue over and above such interest, it would seem that this country would be justified in undertaking a far greater first cost in providing an outlet to the seaboard for the commerce of the lakes.

MR. EUGENE T. CHAMBERLAIN, United States commissioner of navigation, favors us with a very interesting communication on the subject of taxation of vessels, which appears elsewhere in this issue. Mr. Chamberlain's investigations on this subject will go a great way towards proving to the state and municipal authorities that they have nothing to gain in exacting excessive taxes from vessel property.

REPORTS regarding the new United States cruiser Columbia's deep sea trial would seem to doubly entitle her to the name "Queen of the Seas." She is reported to have made 24 knots in an hour and 12½ knots in half an hour under only natural draft.

Trials of the Sharpshooter.

In the recent trials of the Sharpshooter, British navy, fitted with eight Belleville boilers, the Belleville company assumed no responsibility for the I. H. P. of the engines, the condition being that, under natural draft the boilers should be capable of burning a certain quantity of coal per square foot of grate, and that evaporation per pound of coal should not fall below a certain figure. The combined grate and heating surface were respectively 269 and 7,696 square feet. Each set of boilers was tried separately, on different days for a period of twelve hours, during which the mean rate of combustion was twenty-three pounds per square foot of grate, one-half pound more than stipulated. Then followed an evaporative test, lasting eight hours, resulting in a mean of 8.2 pounds of water per pound of coal. During all of these tests, as well as another of two of the boilers under forced draft, burning thirty pounds of coal per square foot of grate, the boilers worked satisfactorily, the only hitch occurring in one of the subsequent trials, where there was trouble with the automatic feed regulator, owing to failure of one of the attendants to connect the float.

The Sharpshooter then made three runs at sea, the first of twenty-four hours duration, using six boilers, being for economy, burning less than ten pounds of coal per square foot of grate. The results were: 14.5 knots, and 1,282 I.H.P. on a coal expenditure of 1.96 pounds per I.H.P. The next trial was made with one set (four) of boilers, and lasted twelve hours, the rate of combustion for one-third of the time being about thirty-one pounds per square foot of grate, and for the remainder about twenty-five pounds. The results were:

	First four hours.	Eight succeeding hours.
Steam pressure in boilers.....	186.	182.
Vacuum	28.4	28.6
Revolutions.....	206.9	185.6
I.H.P.....	1,497.	1,235.
Speed.....	15.2	14.0
Coal per I.H.P.....	2.78	2.66

The last trial was made under similar conditions with the other set, the result being:

	202.	170.
Steam pressure in boilers.....	202.	170.
Steam pressure at engines.....	139.	124.
Vacuum	28.	28.1
Revolutions.....	180.	177.4
I.H.P.....	1,421.	1,191.
Speed.....	14.8	14.
Coal per I.H.P.....	2.93	2.78

Detroit's Local Pride.

The city of Detroit can place more offerings at its own little altar of local pride than all other cities of the lakes put together. Its newspapers have been known to make as much fuss over a Chrysanthemum show as Chicago did with the world's fair. Here's a sample of the town's pride from a steamboat standpoint:

"Walter O. Ashley says the North West's running time from abreast of First street until passing Sandwich point was 8½ minutes. The Frank E. Kirby afterwards swung out from her dock and covered the same distance in 8 minutes. Nor was she going at full speed when she straightened down as was the case with the North West. The opinion is freely expressed by mariners and experienced steamboat men that the City of Detroit can beat the big white steamer's time between Detroit and Cleveland."

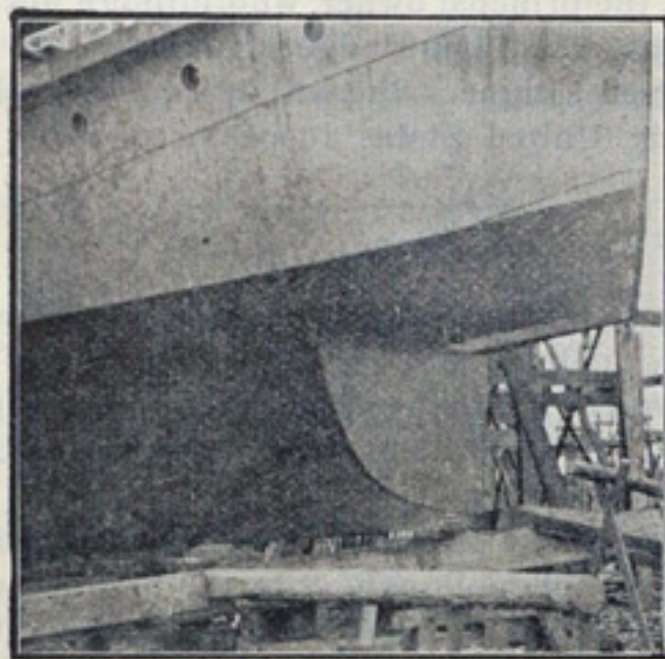
Now Detroit has a ship building concern (the Detroit Dry Dock Company), of which the city has reason to feel proud. The two side-wheel steamers referred to were built by the dry dock company, and they are good boats, but it is not probable that their builders are responsible for any statements that would attempt to class them with a steamer of 7,000 horse power. There has been a great deal of talk of 20-mile boats on the lakes, but it probably remains for the new Northern Line ship to show that speed in actual service.

To Build Belleville Boilers in Boston.

In a discussion about water tube boilers at a recent meeting of New York members of the American Society of Mechanical Engineers, Mr. J.T. Boyd said: "Several years ago when I was engineer at the Atlantic Works, East Boston, we installed the first Belleville boilers that were put into any vessel in this country. They were put in the yacht Shearwater and the objection then raised was their weight. We had no very good comparison at the time, but these boilers performed very successfully. One winter they went on a cruise to the Caribbean sea. We are so much interested in the subject in Boston that we are investigating it and probably will undertake the building of the Belleville boiler there under the Belleville patents. From our experience, without going into detail at all, we think it possesses qualities that are not possessed by any other multitubular boiler. The experiments made by the government on the Shearwater were made to test the rapid evaporating efficiency with 100 pounds of steam only. The Belleville system is to carry from 200 to 250 pounds of steam and then through a reducing valve to reduce the pressure in the engine. They are to carry 250 on their boilers and 180 to 200 on the engines."

The Mackinaw's Bow Rudder.

The accompanying illustration, showing very clearly the bow rudder of the Detroit and Cleveland Steam Navigation Company's side-wheel steamer City of Mackinaw, was prepared from a photograph taken by Mr. F. A. Kirby, superintendent of the Detroit Dry Dock Company's ship



yard at Wyandotte. Its use makes the employment of tugs unnecessary when the boat goes into Alpena and other ports on her run between Detroit and Mackinaw. It is situated at the fore-foot, is set into the hull, and in fact is a part of the stem. It rests in a pintle and when the vessel is outside the rudder is locked in place so that it is immovable.

The Plate Test at Indian Head.

Washington advices are to the effect that the value of treating heavy armor for our war ships with the Harveyizing hardening process is made extremely doubtful by the result of recent tests at Indian Head with 18-inch nickel plate from the Bethlehem Iron Works, fired at by two projectiles from a 12-inch rifle.

There are several elements of doubt in the minds of ordnance officers and others as to the true significance of the failure of the heavy plate. The Bethlehem company's representatives believe that it was demonstrated conclusively that when armor beyond 14 inches in thickness is treated the value is lost and the strength of the plate weakened. Capt. Sampson, chief of the ordnance bureau, and other experts on armor, still maintain that it has not been satisfactorily demonstrated that the process can not be applied to heavy as well as light armor, and that in the recent test the plate would have suffered the same had it not received the Harvey treatment, and might have even fared worse.

Under the terms of the contract the government will allow a second trial, but should the plate not do better than the first, the entire lot will be rejected. The loss to the company would in this event be fully \$300,000, as each plate costs about \$15,000, ready for delivery. The delay incident to the rejection would prevent the completion of the battle ships several years, and an entirely new method of manufacturing heavy armor plate might be necessary.

A conference will be held at the navy department shortly, when the subject of Harvey treatment will be considered. The government's contracts with the Carnegie and Bethlehem companies now require that all armor be Harveyized, and the greater part furnished has been so treated.

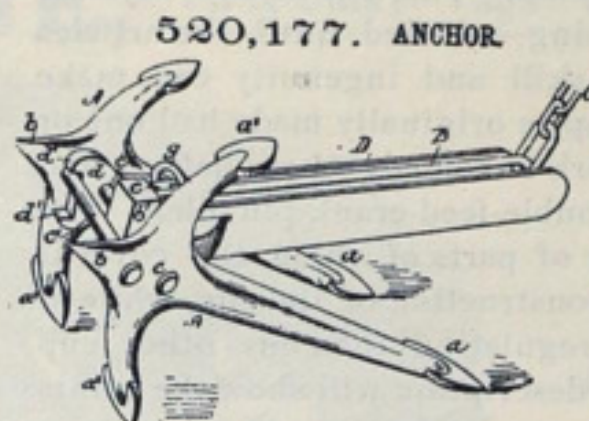
Henry L. Brown, a Bay Shore, L. I., oyster packer, is a convert to the practical use of water tube boilers. He writes the Finlayson Boiler Company, Detroit, Mich., that the boiler bought of them uses less fuel and makes more steam than any other he ever saw. He says he would not part with it at any price if he could not get another. He uses salt water when caught in the bay without fresh water, and has raised steam in seven minutes.

Illustrated Patent Record.

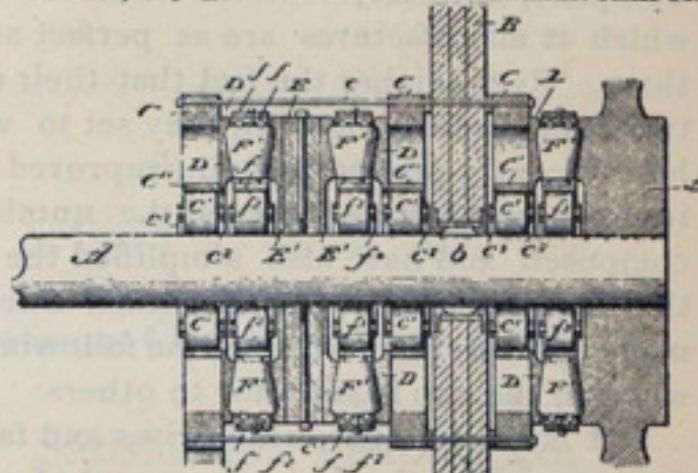
SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

520,177. ANCHOR. David Clark, Easton, Pa. Filed May 27, 1893. Serial No. 475,666. (No model.)

Claim: In an anchor the two three-fluked parts pivoted on and united by two rods or shafts and a shank pivoted on one of said rods, and limited in its pivotal movement by the other in combination with an anchor-chain guide which spans the shank.



520,291 BEARING FOR PROPELLER-SHAFTS



520,291. BEARING FOR PROPELLER SHAFTS. Agide J. Beaudette, Pelican Lake, Wis. Filed Feb. 1, 1894. Serial No. 498,772. (No model.)

Claim: In a thrust-bearing for propeller shafts, the combination, of a shaft having collars E fixedly attached thereto, disks or plates E' rigidly secured to said collars and provided with bearing surfaces, frames C mounted on the main shaft and connected to each other by tie-rods, plates D rigidly secured to the frames C and provided with bearing surfaces which correspond with the bearing surfaces of the disks or plates E', and conical rollers F' journaled between the plates D and E' upon shafts which extend through rings f and f', the bearing surfaces of the plates D and E', being grooved to receive the conical rollers F' and lie over the outer ends of the same.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on May 26, 1894:

	Wheat, bu.	Corn, bu.
Chicago.....	19,268,000	3,438,000
Duluth.....	8,546,000	143,000
Milwaukee.....	1,139,000	3,000
Detroit.....	1,746,000	21,000
Toledo.....	2,627,000	35,000
Buffalo.....	2,077,000	307,000
Total.....	35,403,000	3,947,000

At the points named there is a net decrease for the week of 56,000 bushels of wheat and 366,000 bushels of corn.

WE ARE NOW IN POSITION TO FURNISH BROMIDE CRAYON PORTRAITS OF YOUR BOAT, 14 BY 22 INCHES, FOR \$5 EACH. IT IS NECESSARY TO HAVE A PAINTING OR PHOTOGRAPH OF YOUR BOAT TO WORK FROM. IF YOU HAVE NONE, WE CAN HAVE ONE TAKEN WHEN YOU COME INTO CLEVELAND FOR \$1 EXTRA. AT PRESENT WE CAN FURNISH SUCH BOATS AS THE W. H. GRATWICK, (STEEL), THE NORTH WEST, VIRGINIA, (NIGHT SCENE), THE CITY OF DETROIT, PONTIAC AND MANY OTHERS. WRITE US ABOUT IT. MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

CLEVELAND, O., May 14, 1894.

FIREBOAT — TO CONTRACTORS — Sealed proposals, accompanied with plans and specifications, for furnishing the City of Cleveland, O. with a wood, steel, or iron fireboat, without the motive power or pumps, will be filed with the clerk of the Board of Control, room No. 105, City Hall, until 12 o'clock, noon, Thursday, June 14, 1894. No bid will be received or considered after the hour named.

The boat to be of the following dimensions:
88 feet long over all.
22 feet beam.
11 feet hold.

Plans and specifications will be on file in the office of the Director of Fire service, room No. 115 City Hall, after June 1, 1894.

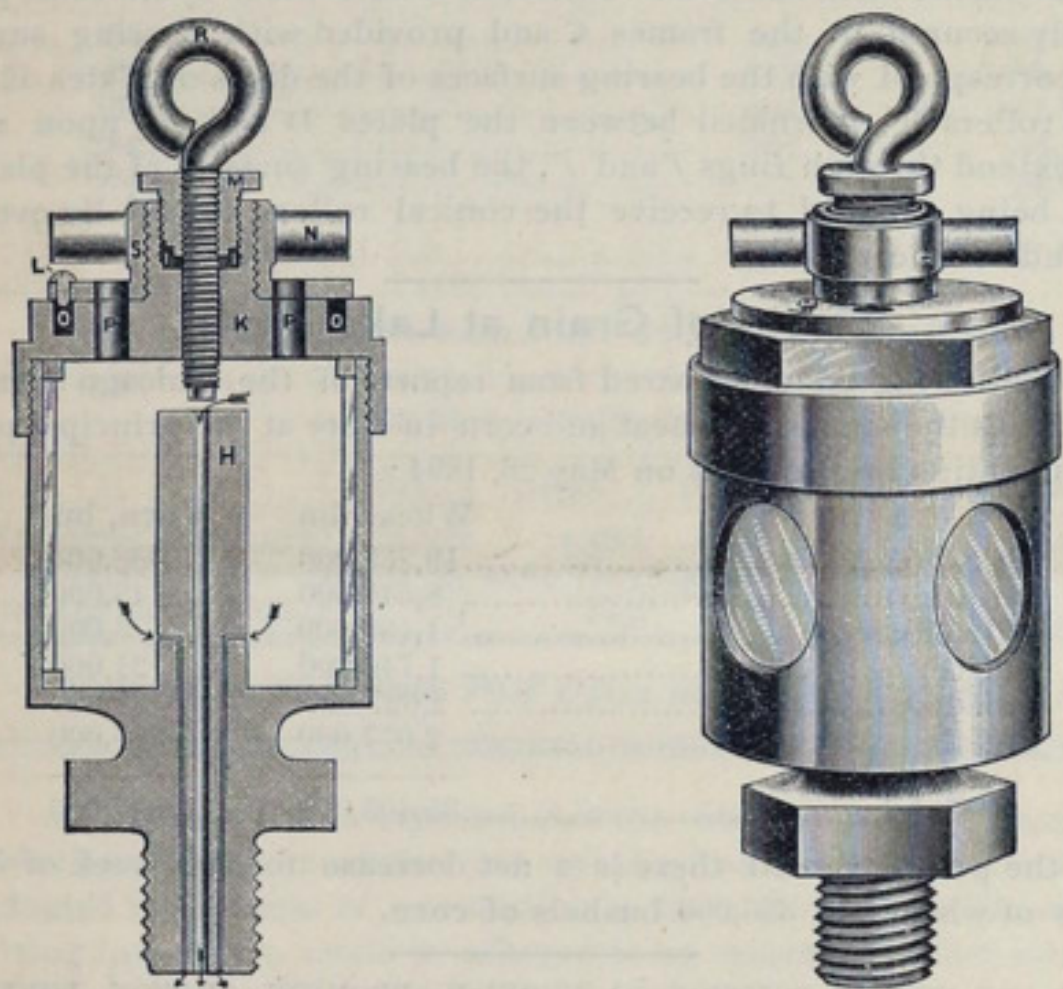
The whole work and material, also the design and arrangements of all fittings and appliances used in the construction of the boat, are to be subject to the approval and direction of the Director of Fire service and the supervisor whom the Director may appoint. The successful bidder will be called to enter into a contract for furnishing the boat complete in all respects, ready for service, except the motive power, pumps, equipments, such as hose, play pipes, Siamese connections, pipe holders, etc., etc. Each bid shall contain the full name of every person interested in the same, addressed to James Hosack, clerk of the Board of Control, and shall be accompanied by a bond or certified check on a solvent bank of this city for an amount equal to 10 per cent. of the amount, that if the bid is accepted the contract will be entered into and the performance of the same properly secured.

The Council may at its discretion reject all the bids or accept any bid which may be the lowest and best bid, when recommended by the Board of Control.
H. H. HYMAN,
Director of Fire Service.

Crank-Pin Oil Cup.

There has always been a demand among engineers and engine builders for a crank-pin oil cup, which would give a steady flow of oil in just the right quantity to keep the crank pin from heating, while not allowing sufficient oil to pass to it so as to cause a waste. Many schemes have been devised for effecting this result, but up to the time the Penberthy Injector Company placed their safety crank-pin oiler on the market, about two years ago, there had been nothing devised that was entirely satisfactory. The safety cup met with a very rapid sale, owing to its simplicity of construction, and its very satisfactory operation. The Penberthy Injector Company, however, is noted for never being satisfied until the articles which it manufactures are as perfect as skill and ingenuity can make them. Recognizing the fact that their cup as originally made had one or two weak points about it, they set to work to remedy these defects and have recently produced their improved double-feed crank-pin oiler. The improvements have lessened the number of parts of which the cover is composed and have also simplified the construction of the cup, while at the same time allowing of a much finer regulation than any other cup made. A careful reading of the following description will show the points wherein the cup is superior to others:

H is the plunger, which rises and falls with the motion of the engine, forcing part of the desired amount of oil to the crank pin, while at the same time the oil is flashed on top of the plunger and passes down through its hollow center, thus giving two distinct and separate feeds, so that in using this cup there are two chances against its feed becoming clogged. K is the cover of the cup, containing two passageways P P. One of these is to allow the air to enter the cup and the other is the vent hole by which

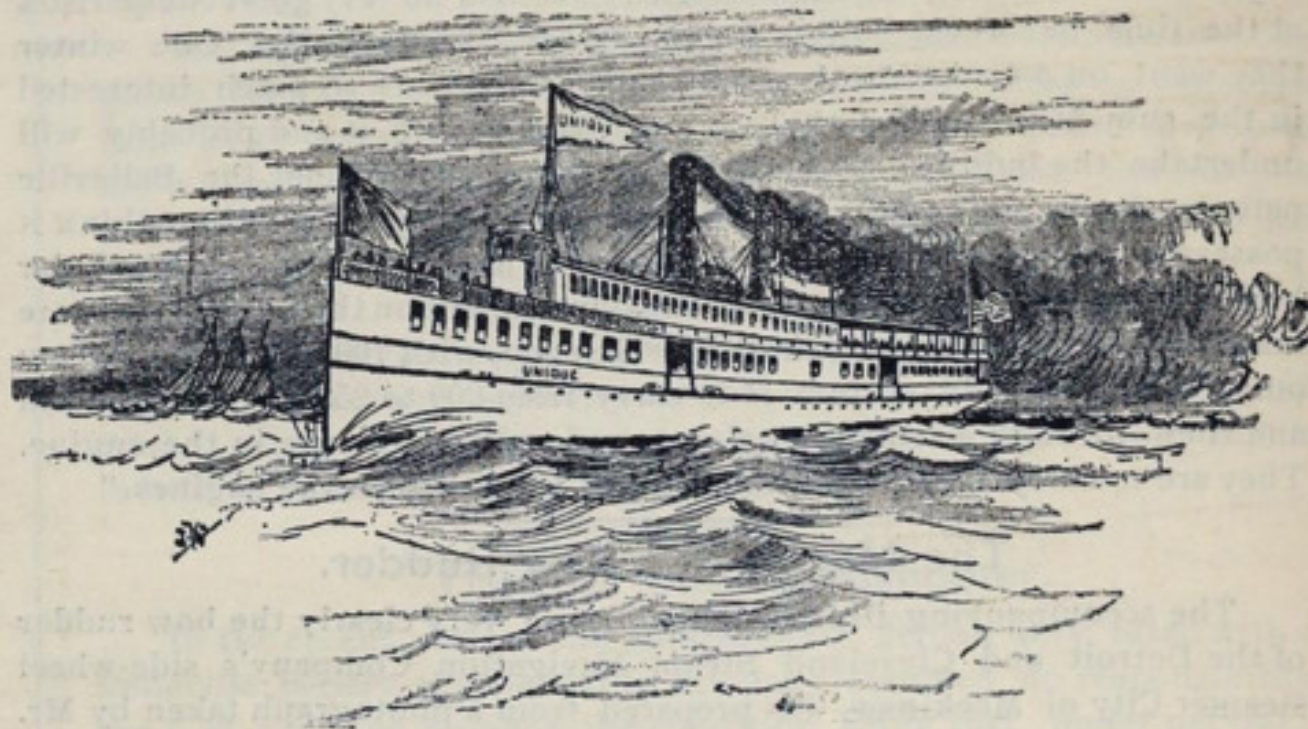


the air in the cup passes out. On top of the cover is an escutcheon S operated by means of a handle N passing through it. When the cup is in operation, this handle is turned hard to the right, bringing the holes in the escutcheon out of line with the holes in the cover of the cup, and the escutcheon being threaded and turning on a corresponding thread on the cup cover, allows of an absolutely tight seat being made between the escutcheon and the cover so that it is impossible for the oil to spill out while the cup is working. To fill the cup the handle N is turned to the left until the holes in the escutcheon and the cover are in line, when the oil can be quickly poured in from a spring bottom can, and as the air is allowed free vent through the vent hole there is no spilling of oil possible with ordinary care. In this manner the cup is filled without changing the regulation in the least. The screw I passing through the escutcheon allows it to turn to the left just a sufficient distance to bring the holes in line. The feed is regulated by the regulating screw R which admits of a regulation as fine as $\frac{1}{1000}$ of an inch or less. This regulating screw passes through the stuffing nut M and through the packing I in the same manner that the stem of a globe valve passes through its stuffing nut, and the tension on the regulating screw is altered by turning this stuffing nut M same as the packing is tightened or loosened on a globe valve.

As will be seen the cup is simplicity itself, and it is impossible to get it out of order. The plunger H having a square shoulder against the bottom of the cup, the oil stops feeding as soon as the engine stops running and there is therefore no waste. Owing to its fine regulation, it can be set to feed just the desired amount of oil and with the proper size cup it can be so regulated as to run for a half or a full day as desired, so that the engine need never be stopped to refill the cup, and the only attention required from the engineer is to fill it at the proper times as it does its work automatically. The manufacturers, the Penberthy Injector Company of Detroit, Mich., will be pleased to send descriptive circulars and quote prices on application.

River Steamer Unique.

A rough sketch of the McElroy steamer, being built at Marine City for the Detroit and Lake St. Clair route, is printed herewith. She is 175 feet long, 26 feet beam over all. The quadruple expansion engines of this boat, which have caused a great deal of speculation as to her speed, and which are being built by the Frontier Iron Works of Detroit, were illus-



trated and described in the REVIEW of May 10. The hull was designed by Mr. C. McElroy, the principal owner, who, although not a practical architect or builder, has a general knowledge of vessels. It is now said that the boat will be named Unique. She will be commanded by Capt. John Robertson, formerly United States inspector of steam vessels in one of the river districts.

The Pilot Charts.

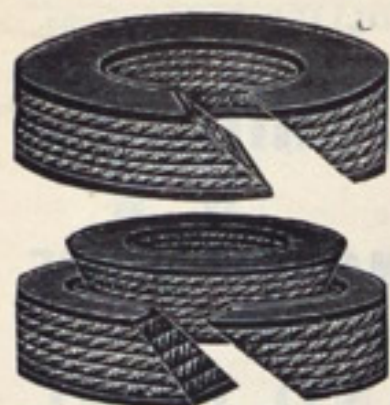
The REVIEW has a limited number of copies of the new pilot chart of the lakes, issued by the hydrographic office. Masters of lake vessels can have them by calling during the coming week. The supply will not last long. Regarding the publication of these charts the chief hydrographer, Commander Sigsbee, says:

"The first edition of the pilot chart was only 2,000 copies. The office is bound down to a considerable extent, by the requirements of law; that is to say, we are supposed to charge for our publications the price of printing and paper, and you will notice that on the new pilot chart the price of 50 cents is set down. In order to circulate this chart with the utmost liberality consistent with the restrictions placed upon the office, it is issued as a pilot chart and help in its preparation was invited from every side. This enables the office to distribute the chart without charge in directions where help might naturally be expected, for an office of this kind depends very largely for its information on exchanges everywhere.

"The office has ready for the press a book of sailing directions—that is to say a descriptive nautical book—of Lake Superior, but our appropriation for printing is now so low toward the end of the fiscal year that we will not be able to send the book to press until after the first of July."

OFFICE OF ENGINEER, NINTH AND Eleventh Districts, Detroit, Mich., May 14, 1894. Proposals will be received at this office until 3 o'clock p. m. of Thursday, the 31st day of May, 1894, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal work for tower for Twin River Point light station, Wisconsin. Plans specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major of Engineers, U. S. Army, Light House Engineer.

TREASURY DEPARTMENT, OFFICE OF General Superintendent U. S. Life-Saving Service, Washington, D. C., May 1, 1894. Sealed proposals will be received at this office until 2 o'clock p. m. of Thursday, the 31st day of May, 1894, for furnishing supplies required for use of the Life-Saving Service for the fiscal year ending June 30, 1895; the supplies to be delivered at such points in New York City, Grand Haven, Mich., and San Francisco, Cal., as may be required, and in the quantities named in the specifications. The supplies needed consists of Beds and Bedding, Blocks and Sheaves, Cordage, Crockery, Furniture, Hardware, Lamps, Lanterns, etc.; Lumber, Medicines, etc.; Paints, Oils, etc.; Ship Chandlery, Stoves, etc.; Tools, and miscellaneous articles; all of which are enumerated in the specifications attached to the form of bid, etc., which may be obtained upon application to this office or the Inspector of Life-Saving Stations, 24 State street, New York City; Superintendent Eleventh Life-Saving District, Grand Haven, Mich., and Superintendent Twelfth Life-Saving District, Appraisers' New Building, San Francisco, Cal. Envelopes containing proposals should be addressed to the "General Superintendent U. S. Life-Saving Service, Washington, D. C.," and marked on the outside "Proposals for Annual Supplies." The right is reserved to reject any or all bids and to waive defects, if deemed for the interests of the Government.



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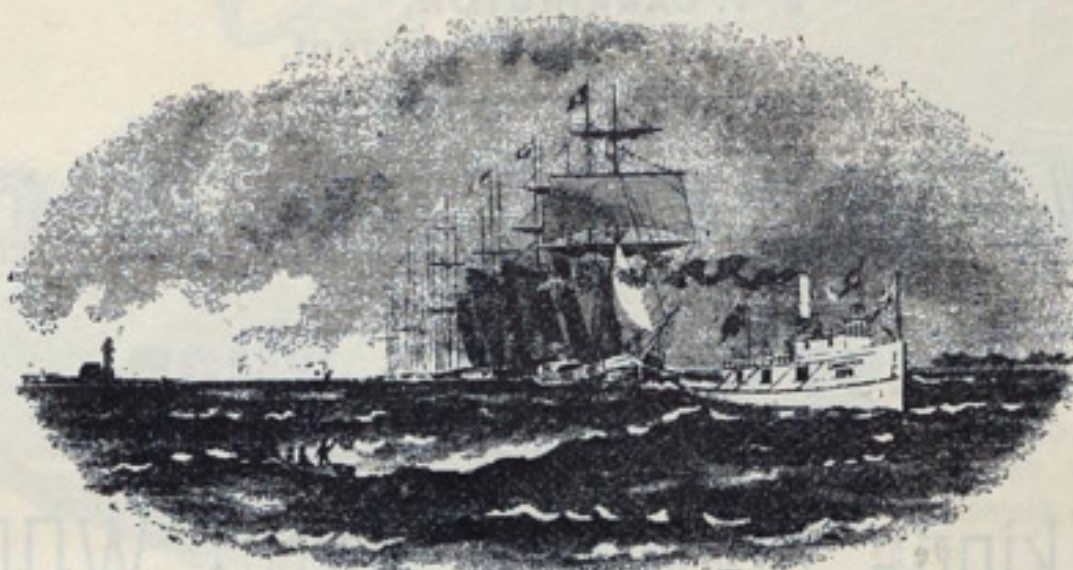
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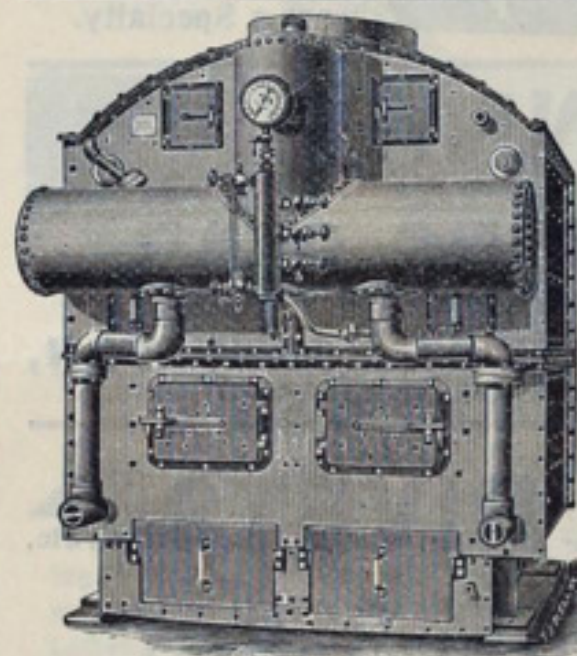
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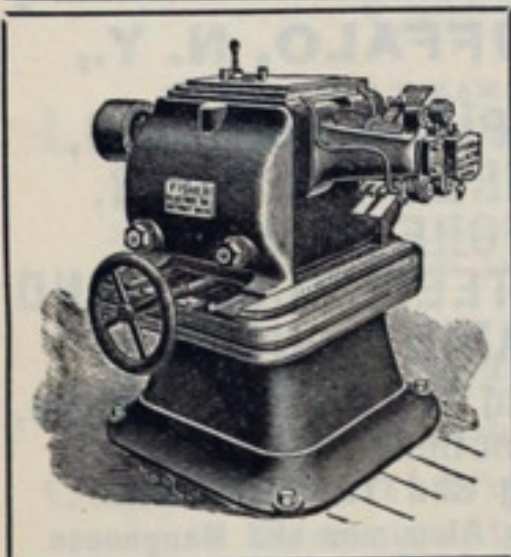
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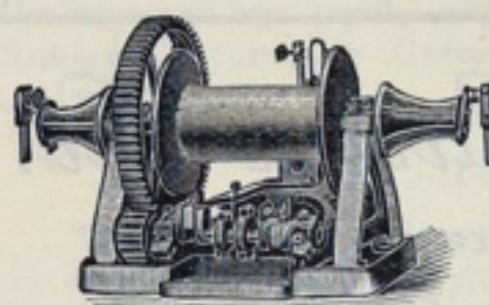
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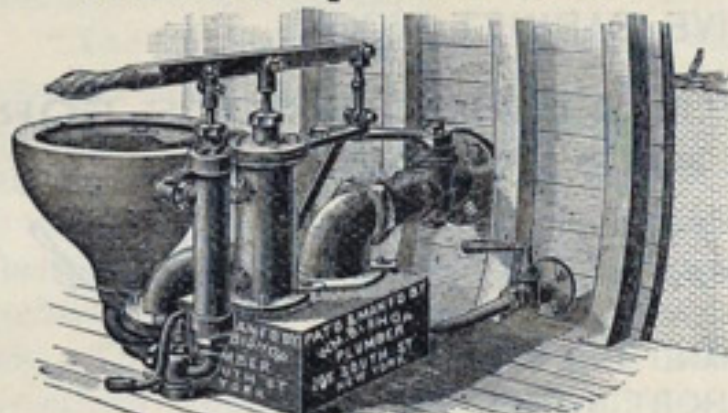
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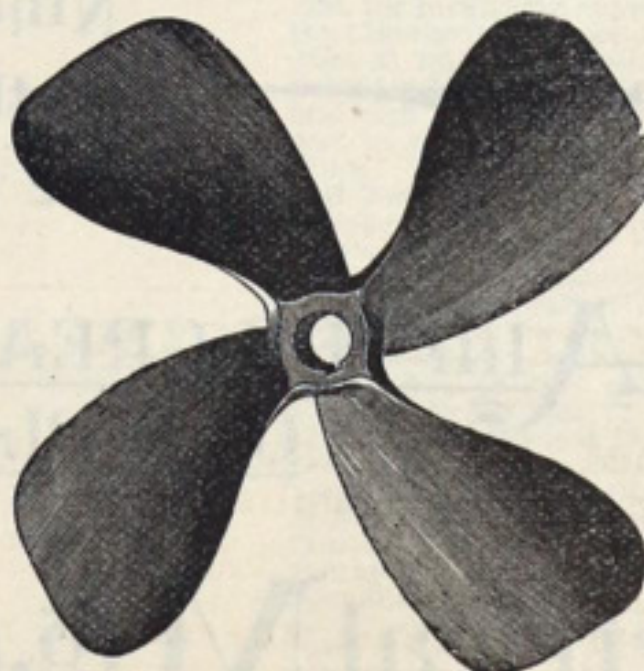
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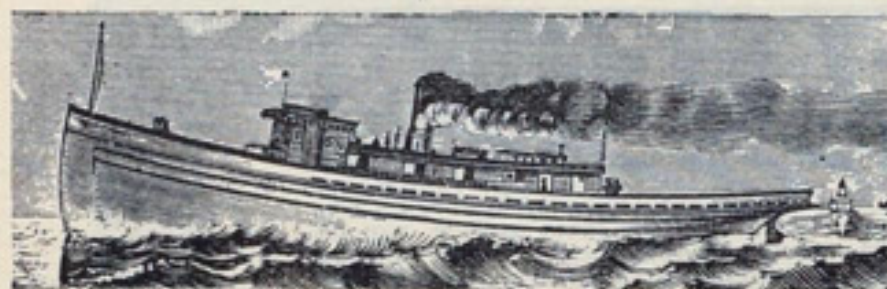
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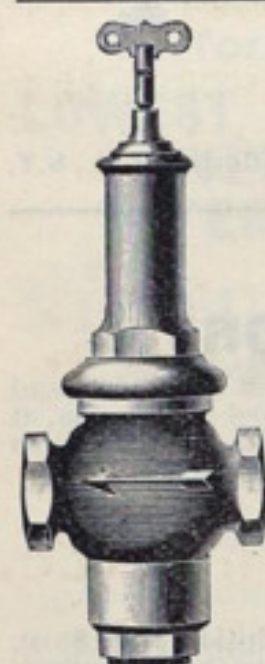
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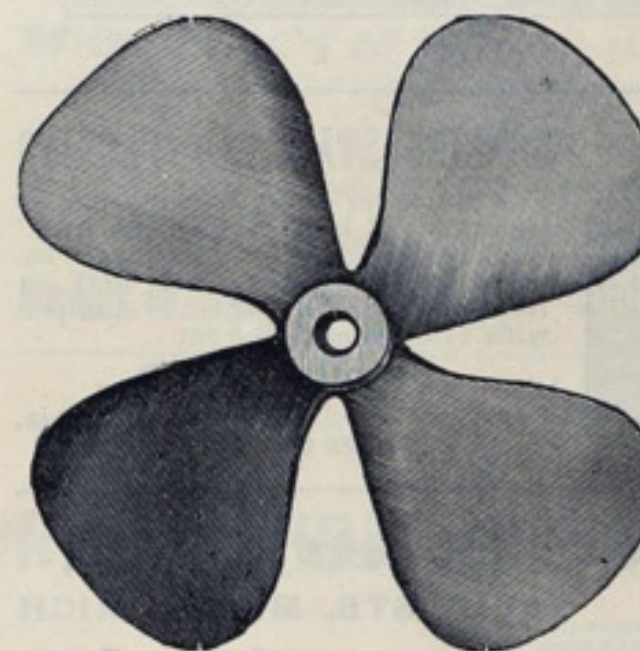
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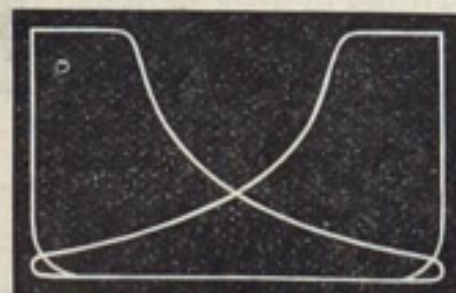
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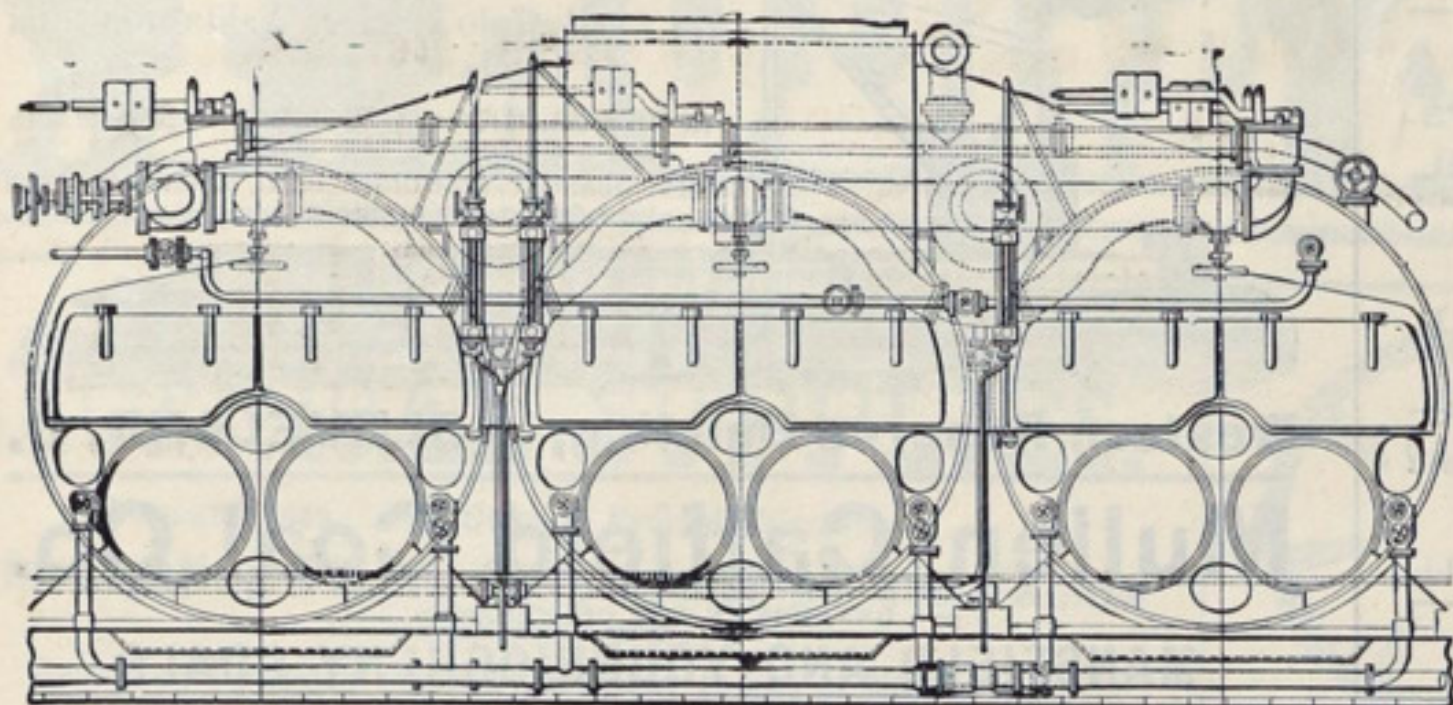
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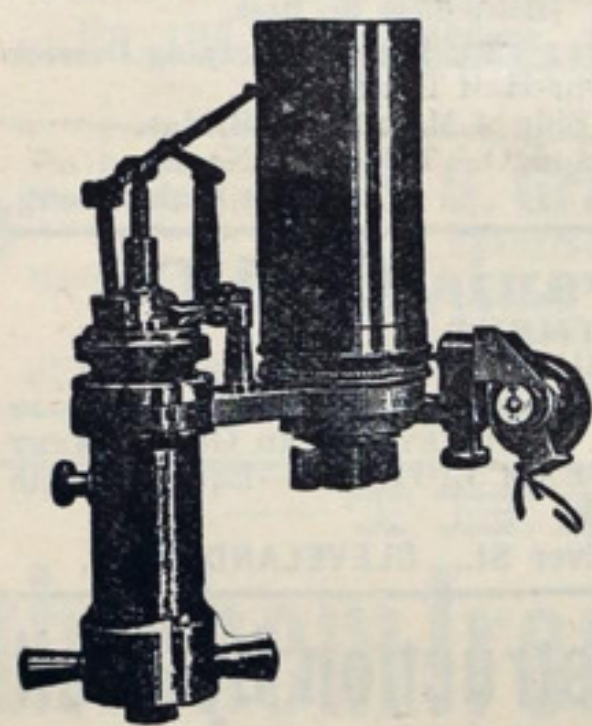
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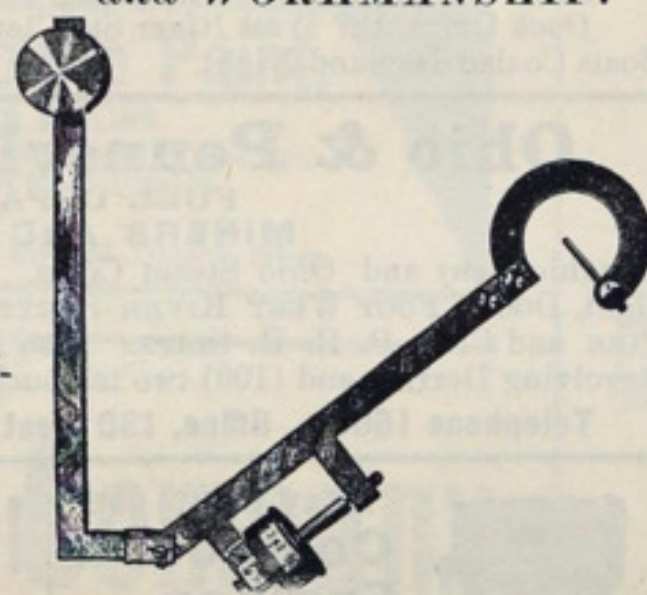
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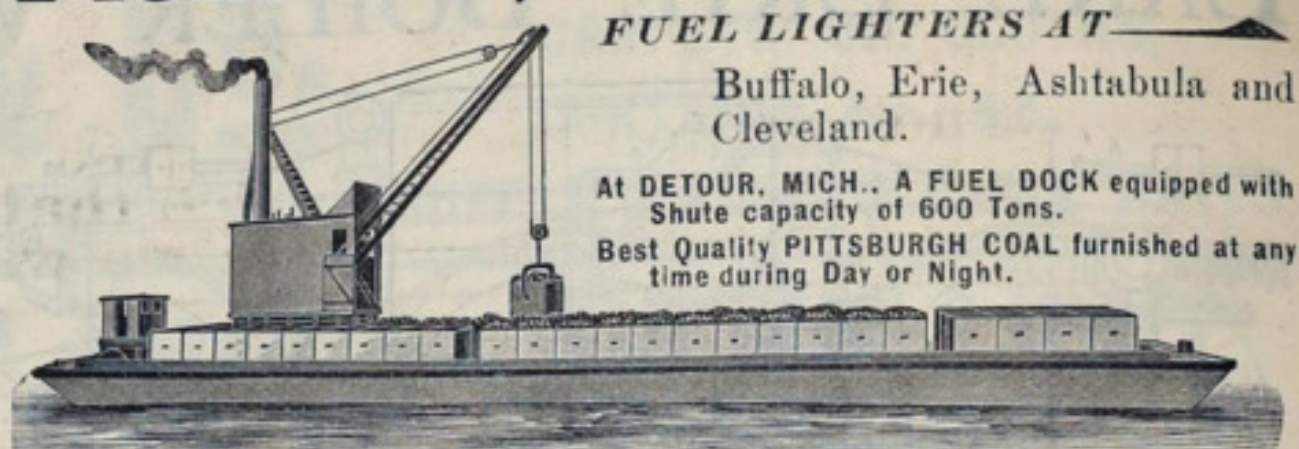
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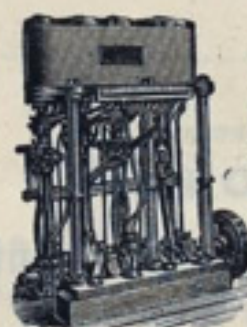
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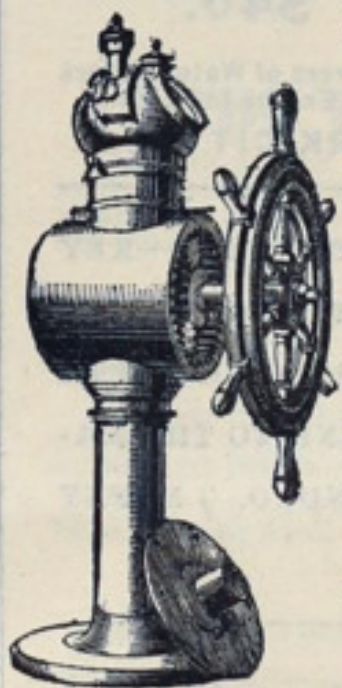
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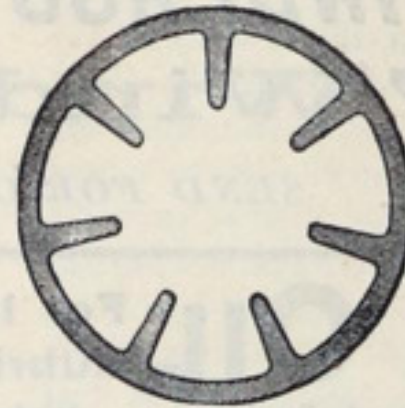
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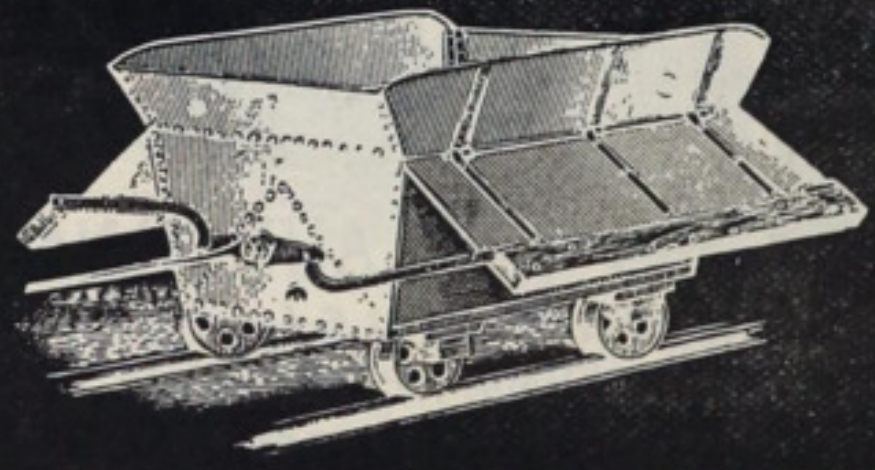
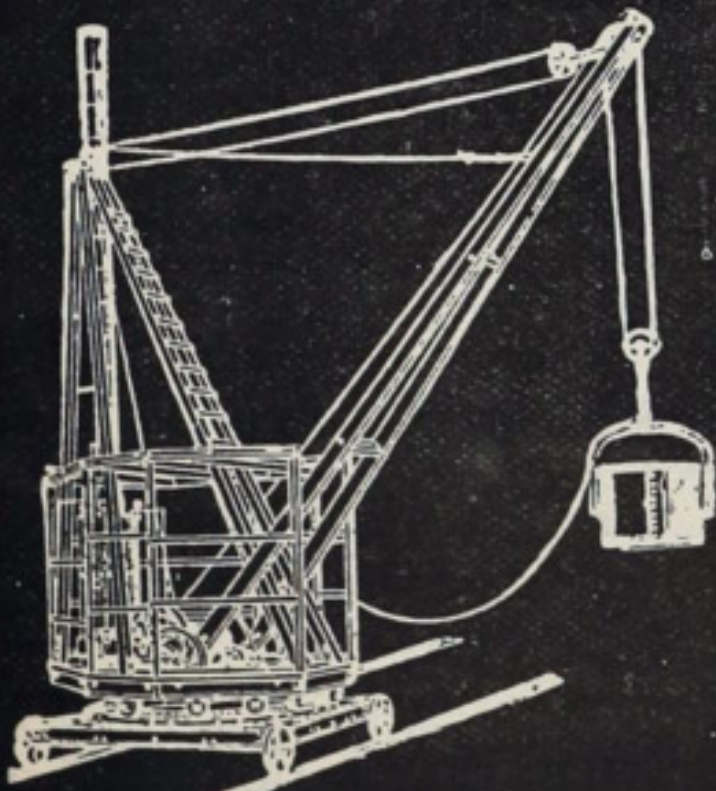
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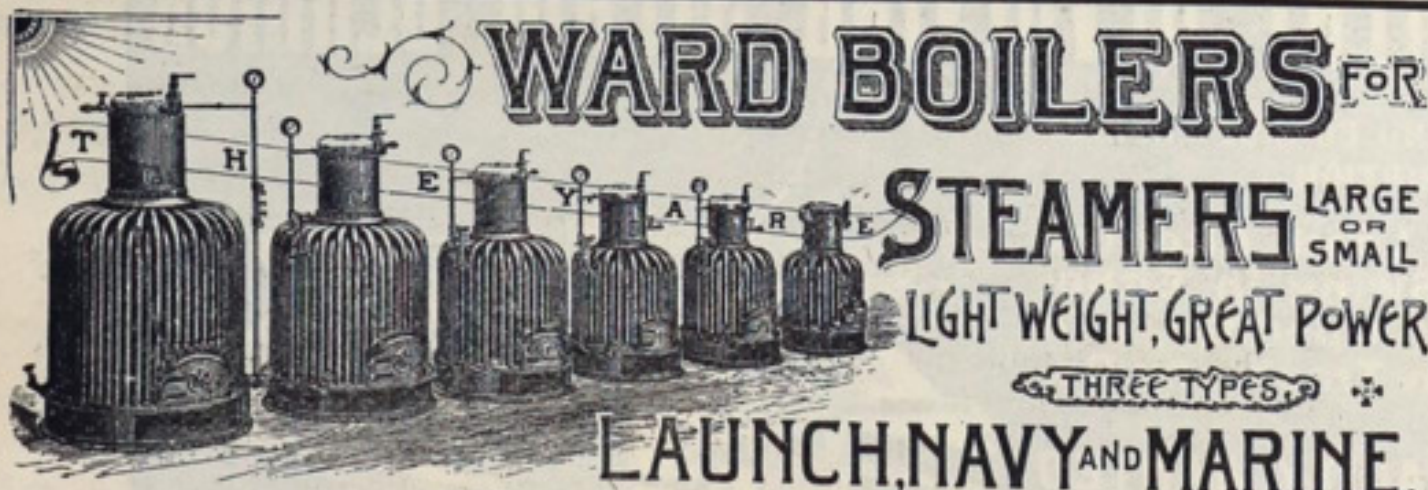
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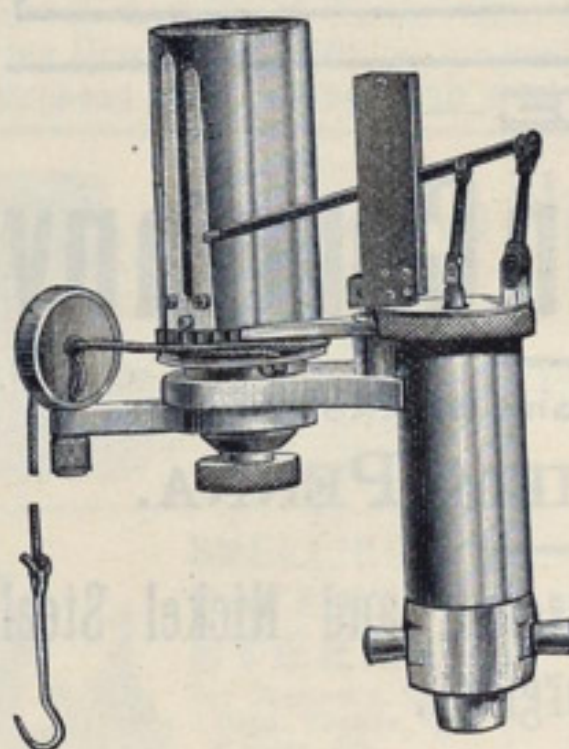
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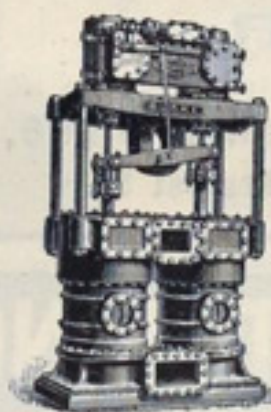
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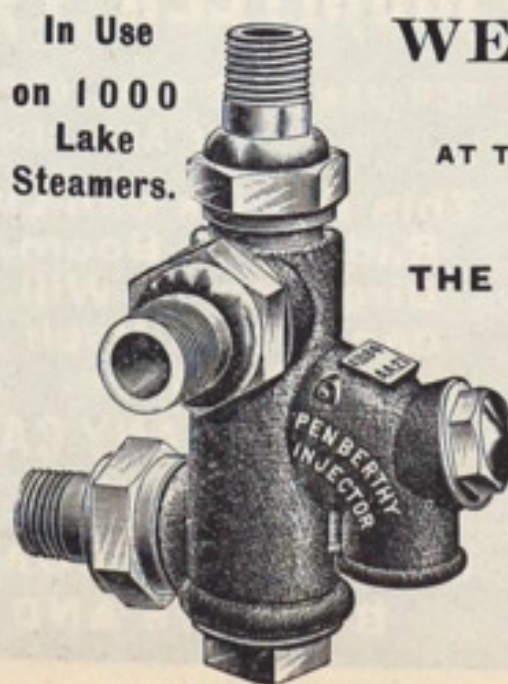
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